

WHAT IS CLAIMED IS:

1                   1.       In a data storage network, a method of maintaining data coherency  
2       using two or more array management functions (AMFs) that are able to concurrently  
3       access a redundancy group, the redundancy group including a plurality of resources, the  
4       method comprising:

5                   receiving a request from a host, by a first one of the AMFs, to perform a  
6       first operation on data stored on a first one of the resources;

7                   broadcasting a message from the first AMF to the other AMFs sharing  
8       access to the first resource so as to acquire access to the first resource; and

9                   performing the first operation on the data by the first AMF.

1                   2.       The method of claim 1, wherein the first operation is a write  
2       operation, the method further comprising receiving from the host the data to be written to  
3       the first resource by the first AMF.

1                   3.       The method of claim 2, wherein the broadcast message is a write  
2       invalidate request, and wherein, responsive to the invalidate request, each of the AMFs  
3       sharing access to the resource invalidates corresponding data stored in its cache.

1                   4.       The method of claim 2, further comprising sending replication and  
2       state data from the first AMF to one or more other AMFs concurrently with performing  
3       the write operation.

1                   5.       The method of claim 1, wherein the first operation is a read  
2       operation.

1                   6.       The method of claim 5, further comprising performing a search of  
2       the cache of each of the AMFs sharing access to the first resource for a copy of the data  
3       requested in the read request.

1                   7.       The method of claim 6, further comprising reading the requested  
2       data from the first resource if none of the AMFs sharing access respond with a copy of  
3       the requested data.

1                   8.       The method of claim 6, further comprising receiving the requested  
2       data from one of the AMFs sharing access to the resource.

1           9.     The method of claim 5, wherein the broadcast message identifies  
2 the data in the request, the method further comprising searching the cache of each of the  
3 AMFs sharing access to the first resource for the identified data, and forwarding the  
4 identified data to the first AMF if found in the cache.

1           10.    The method of claim 1, further comprising determining whether  
2 the data identified in the request is shared by one or more other AMFs.

1           11.    In a data storage network, a method of maintaining data coherency  
2 using two or more array management functions (AMFs) that are able to concurrently  
3 access a redundancy group, the redundancy group including a plurality of resources, the  
4 method comprising:

5                receiving a request from a host, by a first one of the AMFs, to perform a  
6 first operation on data stored on a first one of the resources;

7                determining from the request whether the identified data is shared by one  
8 or more of the other AMFs; and

9                if so:

10               broadcasting a message from the first AMF to the other AMFs sharing  
11                access to the first resource so as to acquire access to the first  
12                resource; and

13               performing the first operation on the data by the first AMF; and

14               if not:

15               performing the first operation on the data by the first AMF.

1           12.    The method of claim 11, wherein the request is one of a write data  
2 request and a read data request.

1           13.    The method of claim 11, further comprising sending replication  
2 and state data from the first AMF to one or more other AMFs concurrently with  
3 performing the first operation.

1           14.    The method of claim 11, wherein the broadcast message is a write  
2 invalidate request, and wherein, responsive to the invalidate request, each of the AMFs  
3 sharing access to the resource invalidates corresponding data stored in its cache.

